

to extend to at least twice this distance. The whole corona had an appearance of movement, suggesting to Mr. Buchanan certain features which occur when a search-light illuminates the atmosphere.

Observations of the partial eclipse are of no great interest as compared with those made during totality, but a number of thermometric readings were recorded at numerous stations. Mr. Spencer Russell, in a communication to the *Standard* for September 2, gives a table of fifteen-minute observations of a wet and dry bulb thermometer, made at Epsom between 11.45 a.m. and 2 p.m. on the day of the eclipse. Whilst the wet bulb readings remained constant at 53° F., the dry bulb showed a minimum temperature of 54° F. between 12.45 and 1.30 p.m. Photographs of the partial eclipse were secured by Messrs. Spencer and Butler during a balloon journey from Wandsworth to Caen in Normandy.

An interesting record of a series of "pin-hole" images of the crescent sun reaches us from Sir Joseph Fayrer, F.R.S. Whilst sailing in a ten-ton boat having a large mainsail, he observed the partial eclipse under favourable conditions in Falmouth Bay. About 1 p.m. a slight breeze caused the sail to incline from the perpendicular, and a number of well defined crescent images were projected on to the whitened deck of the boat, and occasionally on to the water. An investigation showed that these images were formed by a series of eyelet holes, used for the balance reef, high up in the sail. The phenomenon was so vivid and the images so sharply defined as to appear worthy of record.

A correspondent to the *Daily Graphic* (September 2), the Rev. Frederick Ehlers, rector of Shaftesbury, Dorset, records the remarkable phenomenon of an evening primrose unfolding itself during the eclipse as if evening had arrived. Observers at the Solar Physics Observatory, South Kensington, were prevented by clouds from seeing the eclipse, except for one or two breaks of short duration. About one minute before last contact, however, the sky suddenly became clear for a short distance around the sun, and brilliant sunshine prevailed as the last trace of the moon left the solar disc.

TECHNICAL EDUCATION IN NATAL.¹

THE report of the commission appointed to inquire into technical education in Natal has just been received. It is signed by eleven out of twelve of the commissioners, and Mr. C. I. Mudie, superintendent of education, has forwarded a minority report.

The commission, under the presidency of Sir David Hunter, K.C.M.G., held eleven meetings and examined fifty witnesses; some of the members were also sent to Johannesburg to confer with the council and board of studies of the Transvaal Technical Institute. Delegates from the Orange River Colony also attended the conference.

The commission finds that Natal, with its European population of 97,109, has as yet but meagre provision for technical and higher education, and, indeed, states that boys who had received primary and secondary education in the colony were frequently found to be so deficient in general knowledge that they were not well qualified to enter upon technical education.

The result of inquiries as to the probability of youths availing themselves of instruction should it be placed within their grasp was decidedly encouraging, and the commission concludes, from the evidence and

statistics, and from the fact that considerable sums are being expended by individuals in Natal on American correspondence classes and private tuition, that there is an urgent necessity for more adequate provision to equip the youth of the colony for the battle of life.

The resolutions of the conference held at Johannesburg point out that there is a present and immediate need for a full teaching university in South Africa, and that the colonies in which the university may not be situated should each have one or more colleges or institutes devoted to higher or technical education which should be recognised by the university council as integral parts of that teaching university, and that the university should grant diplomas in professional subjects, and degrees in arts and science, in the faculties of (1) education; (2) engineering, including mining; (3) agriculture; (4) law; and (5) medicine.

The recommendations of the commission are based upon the resolutions of the conference, and suggest that immediate steps should be taken by the Government to provide for higher education; that a council be appointed by Government to organise and control technical education in Natal which shall be independent of the education department, although that department should be represented on the council. It suggests that specialists be obtained as lecturers in (1) chemistry and metallurgy; (2) physics and electro-technics; (3) natural science (botany, zoology, geology, physiology); (4) pure and applied mechanics; (5) modern history and literature; while other subjects would be taught by local part-time men.

It is suggested that Pietermaritzburg has first claim for this college, but that Durban also has claims, and the commission thinks that the foregoing lecturers should be peripatetic, in the first place teaching at Pietermaritzburg and Durban only, but as occasion required going farther afield.

While appearing to have somewhat wide views as to the subjects that should be taught—for twenty-six branches are mentioned in the list of subjects in which the commission finds there is a need for classes—the estimates of cost are strictly moderate, for the annual expenditure is taken at 6500*l.*, and the initial expenditure to provide the necessary equipment for engineering, chemical, physical, natural science, and other laboratories is estimated at about 2000*l.* It is true that no provision is made in this estimate for rent or capital expenditure on buildings, but we should think even without these the estimate was likely to be exceeded.

All institutions, however, must have a beginning, and those which start with the highest aspirations have a good chance of attaining some, if not all, of their objects. There can be no doubt that technical education should be conducted everywhere quite apart from the education department, and as much as possible under the guidance of men who are acquainted with some at least of the subjects that are being taught. Technical education, especially in the colonies, should be made accessible to everyone, and should more especially offer inducements to those who are working for their living to improve their knowledge of the sciences which underlie their handicrafts. If this be the first object in view, it will be evident that evening classes and evening laboratory work must be undertaken before any attempt is made to form day classes. It appears to be chiefly on this subject that Mr. Mudie dissented from the report of the commission, for he thinks the college at Pietersburg, which, as he says, covers a preparatory, a high school, and a college proper, should form the nucleus of a university college in Natal. It would not seem to be a desirable thing to commence operations in this way for many reasons, the principal of

¹ Colony of Natal. Report of the Technical Education Commission May, 1905. (Maritzburg: P. Davis and Sons, 1905.)

which is that artisans, clerks and others, for whom technical education is primarily provided, while wishing to learn, have in many cases left school so recently that they do not wish to return, and those of maturer age are not always quite certain whether their dignity will allow them to go to school again.

THE WOBURN EXPERIMENTAL FRUIT FARM.

THE fifth report on the Woburn Fruit Farm, by the Duke of Bedford and Mr. Spencer U. Pickering, F.R.S., contains a very useful summary of the results of ten years' experiments and observations on apple-trees. The conclusions arrived at are based on measurements of leaves, trees, and fruits, and also on weighings of the fruit. The average size of the leaf of the tree seems gradually to diminish with age, and there is a similar but less marked tendency in the fruit. The experiments indicate no advantage from heavy thinning of the fruit, for the size was not increased; hard pruning proved unprofitable, unpruned trees were three times more productive than those heavily pruned; summer pruning was found not to be desirable, and even moderate root pruning was found to injure the trees. Apple-trees transplanted at 2-3 years old were found to grow better than either younger or older plants.

A very curious result which for some time puzzled the experimenters was that carelessly planted trees, though weak at first, ultimately made more growth than those carefully planted. A satisfactory explanation has, however, been found. The roots of carelessly planted trees are so much injured that they make scarcely any growth; the result of this is that numerous new roots grow from dormant buds higher up the stem, and these new roots, not having suffered from transplantation, ultimately surpass in size the original roots of carefully planted trees.

The results obtained at the Woburn Fruit Farm are to some extent due to the particular soil—a moderately stiff clay—but it is probable that the conclusions arrived at would be found to hold good in many English orchards. It is, however, a very difficult thing to judge how far conclusions of the foregoing kind, based on a particular set of conditions, apply under different conditions, and the practical value of the long series of experiments and observations made at Woburn would be very greatly increased if similar experiments were conducted on a soil, or soils, of different character. In any action which the Board of Agriculture and Fisheries may take upon the report of the "Fruit" Committee, it is to be hoped that the important work of the Duke of Bedford and Mr. Pickering may be followed up and extended.

T. H. MIDDLETON.

NOTES.

To commemorate the meeting of the British Association in South Africa, a scheme has been formulated to found a British Association medal for South African students. This announcement was made by Prof. Darwin at the close of his presidential address at Johannesburg. A visit was paid to the Johannesburg Observatory on August 30, and the opportunity was taken of pointing out to Lord Selborne the suitability of the site for a fully-equipped observatory and the necessity for more astronomical work in the southern hemisphere. Referring to this suggestion in the course of his speech introducing Prof. Darwin as president of the association, Lord Selborne is reported by the *Times* correspondent to have said that "he greatly regretted he had been obliged to refuse the only request

that the association had made to him—namely, to find funds for the establishment of a proper observatory in Johannesburg. He was obliged to say that all the revenue they at present possessed was required for the development of their material resources and means of communication; but where the Government was powerless, what a magnificent opportunity there was for a patriotic Transvaal. For a site in the purest atmosphere, 2000 feet above the highest observatory now existing, only 10,000l. was required. There they might establish a telescope which would help observers in the southern hemisphere to compete with the astronomers of the northern hemisphere. The site was there, and it was already occupied by a perfectly equipped meteorological observatory." All the papers on South African matters read during the meeting are to be published in a separate volume by the South African Association for the Advancement of Science. At the closing meeting, held on September 1, Prof. Ray Lankester was elected president of the association for 1906.

MR. J. W. DOUGLAS, one of the editors of the *Entomologist's Monthly Magazine*, died at Harlesden on August 28 in his ninety-first year.

THREE distinct earthquake shocks, the severest ever experienced in the district, were felt at Portsmouth, New Hampshire, on August 30, beginning at 5.40 p.m.

REUTER'S correspondent at Stockholm reports that Prof. Nathorst has received a letter in which Lieut. Bergendahl, who is a member of the Duc d'Orléans's Greenland Expedition, states that on July 27, as the expedition passed Cape Bismarck, unknown land was discovered. It appears that Cape Bismarck lies on a large island, and not on the mainland. The new land has been mapped as well as possible, and has received the name *Terre de France*. The expedition was unable to penetrate further north than 78° 16' N. lat.

At the annual meeting of the Academy of the Lincei, which was held on June 4 in the presence of the King and Queen of Italy, the president, Prof. Blaserna, announced the result of the competition for the three Royal prizes founded by the late King Humbert. In the section of normal and pathological physiology, the prize is awarded to Prof. Aristide Stefani, of Padua, for his published work dealing with the physiology of the heart and circulation, the non-acoustic functions of the labyrinth of the ear, and the serotherapeutic treatment of pneumonia. In the sections of archaeology and of economic and social science, the judges reported that the competitors were not of sufficient merit to justify the award of the prizes. This is the first occasion on which so small a proportion of the prizes have been conferred, and it is proposed that in future the section of archaeology shall embrace not only classical, but also Christian and mediæval archaeology. Ministerial premiums intended to aid original work among teachers in secondary schools were awarded in the department of mathematical sciences to Prof. Ciani (50l.), Prof. Pirondini (38l.), and Prof. Chini (20l.). Out of the funds available from the Carpi prize, a sum of 32l. was awarded to Dr. P. Enriques for a thesis on the changes brought about in absorbed chlorophyll by the action of the liver, and the relation existing between the derivatives of chlorophyll produced in the organism and the genesis of the hæmatic pigments. In his address the vice-president, F. d'Ovidio, discussed in general terms the question "Art for Art's Sake," dealing more particularly with the influence exerted on national life and character by art and literature.